b) * z= -3+3i

$|z| = \sqrt{9+9} = 3\sqrt{2} \rightarrow z = 3\sqrt{2}.(\frac{-1}{\sqrt{2}} + \frac{i}{\sqrt{2}}) = 3\sqrt{2}.(\frac{-\sqrt{2}}{2} + i\frac{\sqrt{2}}{2}) = 3\sqrt{2}.(\cos(3\frac{\pi}{4}) + i\sin(3\frac{\pi}{4})) = 3\sqrt{2}.e^{3i\frac{\pi}{4}}$

* $Z=2\sqrt{3}-2i$

$|Z| = 4 \rightarrow Z = 4.(\frac{\sqrt{3}}{2} - \frac{1}{2}i) = 4.(\cos(-\frac{\pi}{6}) + i\sin(-\frac{\pi}{6})) = 4.e^{-i\frac{\pi}{6}}$

* $1-i = \sqrt{2}e^{-i\frac{\pi}{4}}$ D'où $(1-i)^5 = (\sqrt{2})^5.e^{-5i\frac{\pi}{4}}$

$(1-i)^5 = 4\sqrt{2}.e^{-5i\frac{\pi}{4}}$

* $\frac{1+\sqrt{2}-i}{1+\sqrt{2}+i} = \frac{\left[(1+\sqrt{2})-i\right]^2}{(1+\sqrt{2})^2+1} = \frac{(1+\sqrt{2})^2-1-2i(1+\sqrt{2})}{4+2\sqrt{2}} = \frac{(2+2\sqrt{2})-2i(1+\sqrt{2})}{2(2+\sqrt{2})} = 1-i = \sqrt{2}e^{-i\frac{\pi}{4}}$

EX 9 :

1)

$a = \frac{\sqrt{6}+\sqrt{2}}{2} + i\frac{\sqrt{6}-\sqrt{2}}{2} \Rightarrow a^2 = 2\sqrt{3}+2i \rightarrow |a^2| = 4$

$a^2 = 4\left(\frac{\sqrt{3}}{2} + \frac{1}{2}i\right) = 4e^{i\frac{\pi}{6}}$

D'où $a = 2e^{i\frac{\pi}{12}}$ ou $a = -2e^{i\frac{\pi}{12}} \Rightarrow a = 2e^{i\frac{\pi}{12}}$ ou $a = 2e^{13i\frac{\pi}{12}}$

$\mathrm{Re}(a) > 0$ or $\cos\frac{13\pi}{12} < 0$ D'où $a = 2e^{i\frac{\pi}{12}}$

2)

$a = 2(\cos\frac{\pi}{12} + i\sin\frac{\pi}{12})$

et $a = \frac{\sqrt{6}+\sqrt{2}}{2} + i\frac{\sqrt{6}-\sqrt{2}}{2}$ D'où $\begin{cases} 2\cos\frac{\pi}{12} = \frac{\sqrt{6}+\sqrt{2}}{2} \\ 2\sin\frac{\pi}{12} = \frac{\sqrt{6}-\sqrt{2}}{2} \end{cases} \Rightarrow \begin{cases} \cos\frac{\pi}{12} = \frac{\sqrt{6}+\sqrt{2}}{4} \\ \sin\frac{\pi}{12} = \frac{\sqrt{6}-\sqrt{2}}{4} \end{cases}$

3)

a)

$z_A = 2e^{i\frac{\pi}{12}} \Rightarrow OA = 2$ et $(\vec{u}, \widehat{\overrightarrow{OA}}) \equiv \frac{\pi}{12}(2\pi)$

$z_B = 4ie^{i\frac{\pi}{6}} = 4e^{i(\frac{\pi}{6}+\frac{\pi}{2})} \Rightarrow OB = 4$ et $(\vec{u}, \widehat{\overrightarrow{OB}}) \equiv \frac{2\pi}{3}(2\pi)$

Qarray.tn - Aqra Blech- Qarray.tn